

PROCEEDINGS
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PSILOSTROPHE, A NEGLECTED GENUS OF
SOUTHWESTERN PLANTS.

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The collections of Mr. Leslie N. Goodding, a student in the University of Wyoming, made in southern Utah and Nevada in the spring of 1902, are bringing to light some exceedingly interesting xerophytic plants. Among these is a shrubby *Psilostrophe* (*Riddellia*), the study of which led to an investigation of the whole genus.

The species formerly recognized are only three and one variety, and in spite of the remarkably heterogeneous mass of material found in the genus, the three names have been made to do duty for all that have been collected. The material found in the Rocky Mountain herbarium seemed to indicate some novelties, but to confirm these, Dr. J. N. Rose, Assistant Curator, U. S. National Herbarium, made it possible for me to examine the much larger series of specimens in that collection. For this favor I wish here to express my hearty thanks.



Key to the species of *Psilostrophe*.

- Pubescence of the stem white and densely pannose. - 1. *P. Cooperi*.
 Pubescence of the stem villous or loosely floccose-lanate.
 Akenes and pappus arachnoid-villous. - - 2. *P. gnaphalodes*.
 Akenes and pappus glabrous.
 Pappus scales lanceolate, acute.
 Floral structures ceriferous; rays small.
 Moderately lanate; perennial - - 3. *P. cerifera*.
 Inordinately lanate; biennial - 3a. *P. cerifera biennis*.
 Floral structures free from wax; rays large.
 Fastigiately branched - - - 4. *P. tagetina*.
 Simple stemmed - - - 4a. *P. tagetina lanata*.
 Pappus scales oval, obtuse, denticulate. - - 5. *P. pumila*.
 Pubescence of stem scanty, softly hirsute. - - 6. *P. sparsiflora*.

1. *Psilostrophe Cooperi* (Gray) Greene.

Riddellia Cooperi Gray, Proc. Am. Acad. 7:358. 1868.

Psilostrophe Cooperi (Gray) Greene, Pitt. 2:176. 1891.

This species needs further study. The series of specimens examined shows much variation and yet not one that tallies closely with the original description. I rather suspect, however, that the original specimens by Cooper were undersized and not typical of the species as now represented; that the description should be expanded to take in more truly shrubby forms, with leaves 4-7 cm. long, larger rays often 5 in number and with more numerous disk corollas (12-20). The pappus seems often to be of nearly entire lanceolate scales and the peduncles are far from filiform. Such amplified characters would take in all of the following, though the description as drawn by Dr. Gray excludes at least the first half of the series that follows:

L. N. Goodding, No. 752, Bunkerville, Nevada, 1902; M. E. Jones, No. 3891, Yucca, Arizona, 1884; Dr. Smart, No. 278, Arizona, 1867; J. W. Toumey, No. 6396, Tucson, Arizona, 1892; W. F. Parish, Lowell, Arizona, 1884; Coville and Funston, No. 292, Pahrump Valley, Nevada, 1891; Dr. Palmer, No. 246, S. Utah, 1887; T. S. Brandegees, Arizona, 1892; Lt. Wheeler, Nevada, 1872; Dr. Palmer, Arizona, 1869; J. W. Toumey, No. 639c, Castle Creek, Arizona, 1892; C. A. Purpus, No. 6125, Pahrump Valley, Nevada, 1898; Dr. Vasey, Tucson, Arizona, 1886.

2. *Psilostrophe gnaphalodes* DC.

Psilostrophe gnaphalodes DC. Prod. 7:261.1838.

Riddellia arachnoidea Gray, Pl. Fendl. 94. 1849.

This species is fairly uniform, though species so ticketed in the herb-

aria are often something else. As observed by Dr. Gray, the foliage is not essentially different from *P. tagetina*. One might suspect that some distributors believe the specific name refers to the pubescence of the leaves. It seems to be confined to Texas and adjacent Mexico.

Chas. Wright, No. 380, Western Texas, 1849; C. G. Pringle, No. 9040, Jaral, Mexico, 1900; F. S. and E. S. Earle, No. 446, Devil River, Texas, 1900; Mex. Bound. Surv., No. 628; L. H. Dewey, College Station, Texas, 1891; V. Havard, No. 45, Stockton, Texas, 1881; M. E. Jones, No. 3718, El Paso, Texas, 1884.

3. *Psilostrophe cerifera*, n. sp.*

Stems few to several from the enlarged crown of a ligneous taproot, or more rarely the crown raised on a short simple caudex; the stems simple or sparingly branched, 1–2 dm. long, floccose-tomentose; leaves lightly lanate, entire, lanceolate-spatulate, obtuse or acute at apex, the tapering base scarcely petioled; inflorescence corymbose, the rather small heads congested on the tips of the branches of the corymb; bracts of the narrow involucre broadly linear, in one series, rigid and closely connivent, the waxy or resinous particles with which they are sprinkled obscured by the lanate pubescence but extending to all parts of the flowers, the akenes, and even to the leaves of the plant; rays usually 3, the ligule 3–4 mm. long and nearly twice as broad, its slender tube equalling the ligule and almost equalled by the linear pappus-scales; disk flowers 10 or fewer, slightly articulatesly enlarged at the summit of the tube proper; akenes glabrous, not striate, somewhat 4-angled; pappus linear, nearly as long as the disk corollas.

The type is Mr. M. A. Carleton's No. 201 (in Ry. Mt. Herb.), from the Cheyenne Country, Indian Territory, June 1891; distributed by the U. S. National Herbarium. Wholly typical are Mr. Paul J. White's specimens, Woods County, Oklahoma, June 29, 1900. Mr. Hitchcock's No. 741, from the Gypsum hills of Barker County, Kansas, is undoubtedly the same, though, on account of age, the leaves are largely wanting. A specimen by Prof. Kellerman, from Kansas, 1888, is more floccose woolly and has the appearance of being merely biennial, and this may be true of Mr. Hitchcock's specimens (the number cited) also.

A very abnormal form is found in Mr. B. B. Smyth's specimens; No. 140, from Crooked Creek, Meade County, Kansas, which tends to confirm the suspicion that in more northern localities this species is altogether biennial. These may be designated:

3a. *Psilostrophe cerifera biennis*, n. var.

Larger than the species, mostly single-stemmed from the crown, often freely and intricately branched above, densely and permanently floccose

*A paratype of *Psilostrophe cerifera* A. Nelson is in the National Herbarium under the herbarium number 26,577.

throughout; crown leaves and lower stem leaves wanting at the time of flowering.

Type of the variety, as cited above, in the National Herbarium (No. 26,577).

4. *Psilostrophe tagetina* (Nutt.) Greene.

Riddellia tagetina Nutt. Trans. Am. Phil. Soc., 7:361. 1841. Gray, Syn. Fl., 317, probably in part only.

Psilostrophe tagetina (Nutt.) Greene Pitt., 2:176. 1891.

Even after segregating the species indicated as new in this paper the specimens at hand show considerable variation and may still be an aggregate, but to the writer the difference seems to be vegetative and not congenital. Judging by the specimens the center of distribution is New Mexico.

Specimens examined.—New Mexico: E. O. Wooton, 1894; id, No. 6, 1897; F. S. and E. S. Earle, No. 374, 1900; A. A. and E. G. Heller, No. 3739, 1897; J. G. Smith, No. 25, 1897; G. R. Vasey, 1881; A. Fendler, No. 461, 1847; J. T. Rothrock, No. 463, 1874. Arizona: Walter Hough, No. 115, 1896; Comanche Plains, J. M. Bigelow, 1853.

Somewhat aberrant and mostly distributed as *Riddellia arachnoidea*, are the following from Texas: L. H. Dewey, 1891; G. W. Letterman, No. 25, 1882; Newberry, 1859; Mex. Bound. Surv., No. 628.

Still more aberrant and probably worthy of a varietal name are some other Texan specimens which may be called:

4a. *Psilostrophe tagetina lanata*, n. var.*

Larger than the species, simple-stemmed or divaricately branched, long-lanate, floccose-woolly at the crown; leaves simple or pinnatifid and some of the stem leaves (often nearly all of them) sometimes deeply pinnately lobed; the lobes oblong-linear, entire or toothed; rays usually larger than in the species.

Specimens examined.—Texas: G. R. Vasey, 1881 (type); Mex. Bound. Survey, No. 629 (paratype); W. L. Bray, No. 416, 1899; (?) J. Reverchon, 1879. Type and paratype in National Herbarium.

5. *Psilostrophe pumila* (Jones) n. comb.

Riddellia tagetina pumila, Jones, Proc. Cal. Acad. Sci., (2) 5:700, 1895.

Psilostrophe Bakeri Greene, Pl. Baker. 3:29. 1901.

This perfectly valid species is certainly the handsomest one in the genus. That Mr. Jones' variety is the same as Dr. Greene's species

*The type and paratype of *Psilostrophe tagetina lanata* A. Nelson are in the National Herbarium under the herbarium numbers, respectively, of 156,585 and 26,581.

admits of no question. The following series of specimens, some distributed as one and some as the other, are remarkably homogeneous, as might be expected, since most of them are from type locality, which is the same for both. A fine example of this by Mr. Osterhout shows that the species under favorable conditions is not unusually low.

Specimens examined. Grand Junction, Colorado, M. E. Jones, 5474 (type), June, 1894; id. May, 1895; C. F. Baker, No. 106; S. G. Stokes, 1900; D. A. Saunders, No. 405, 1893; C. F. Baker, No. 14, Montrose; J. H. Cowen, No. 276, Hotchkiss; G. E. Osterhout, Rifle, Colorado.

6. *Psilostrophe sparsiflora* (Gray) n. comb.

Riddellia tagetina sparsiflora Gray, Syn. Fl. 1:318. 1886.

Stems 1-3 dm. high, singly from the several crowns of the woody root, noticeably striate, green but with a sparse hirsute pubescence which extends to the leaves; leaves alternate, linear, often narrowly so, rarely with one or two lateral teeth, 3-5 cm. long; the lower usually subspatulate and decurrent upon the long slender petiole; heads corymbose on the slender pedunculate uppermost branchlets; ray flowers 3, the ligule 7-8 mm. long and noticeably broader, sprinkled with minute resin or wax particles, the tube very short and only partially closed, the style protruding from the fissure; disk flowers 10 or fewer, tubular, fully twice as long as the unequal, acute or more or less lacerate-tipped papuleæ; akenes angled, not perceptibly striate.

This seems to be a singularly good species. I take as probably typical, of the plant that Dr. Gray so named as a variety, the form that occurs in Utah. That is truly with few heads. The Arizonan form is more freely flowered and with more numerous and more fascicled stems, but in all essentials they are the same. The green almost glabrous aspect, the regular alternation of the slender axillary branches and the almost umbellately-clustered slender-peduncled heads are characters quite peculiar to this species.

Specimens examined.—Utah: M. E. Jones, No. 5296, Pahria Canyon, 1894; Dr. Palmer, No. 246½, Southern Utah, 1877. Arizona: J. B. Leiberger, No. 5624, 1891; L. F. Ward, 1891; D. T. MacDougal, No. 229, 1898; H. H. Rusby, 1883; F. H. Knowlton, Nos. 182 and 272, 1889; M. E. Jones, Nos. 4038 and 6050a, 1884 and 1894; J. W. Toumey, No. 638, 1892.

I place here somewhat doubtfully Mr. Jones's No. 5291i, Pahria, Utah, 1894.